

FORM PTO-1390 (Modified)
(REV 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

836.049

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

10/018414

INTERNATIONAL APPLICATION NO
PCT/GB00/02277INTERNATIONAL FILING DATE
13-June 2000PRIORITY DATE CLAIMED
15 June 1999

TITLE OF INVENTION

LOAD CARRYING BODY

APPLICANT(S) FOR DO/EO/US

DAVID JOHN BOWES BROWN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☒ have not been made; however, the time limit for making such amendments has NOT expired
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☐ Other items or information:

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.137(a) or (b))		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
10/018414		PCT/GB00/02277		836.049	
24. The following fees are submitted:				CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :					
<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO				\$1040.00	
<input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO				\$890.00	
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO				\$740.00	
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)				\$710.00	
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)				\$100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$890.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).				\$130.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =	0	x \$18.00	\$0.00	
Independent claims	1 - 3 =	0	x \$84.00	\$0.00	
Multiple Dependent Claims (check if applicable).			<input checked="" type="checkbox"/>	\$280.00	
TOTAL OF ABOVE CALCULATIONS =				\$1,300.00	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				\$650.00	
SUBTOTAL =				\$650.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				\$0.00	
TOTAL NATIONAL FEE =				\$650.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).			<input type="checkbox"/>	\$0.00	
TOTAL FEES ENCLOSED =				\$650.00	
				Amount to be refunded	\$
				charged	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$650.00 to cover the above fees is enclosed.					
b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-2105 A duplicate copy of this sheet is enclosed.					
d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:					
Andrew S. Langsam, Reg. No. 28,556 Levisohn, Lerner, Berger & Langsam 757 Third Avenue, Suite 2500 New York, NY 10017 Tel. No. 212-486-7272 Fax No. 212-486-0323					
Andrew S. Langsam SIGNATURE Andrew S. Langsam NAME 28,556 REGISTRATION NUMBER Dec. 14, 2001 DATE					

JC13 Rec'd PCT/PTO 14 DEC 2001

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LOAD CARRYING BODY

This invention relates to a load carrying body for a vehicle, in particular for the purpose of facilitating the unloading of material.

Conventionally, material such as earth, stones, rock, coal, or refuse is unloaded from a tipping body, in a manner which is difficult to control.

Ejector bodies are known in which material is pushed out of the body without tipping the body.

Such systems cannot deal with a variety of loads and body lengths.

The present invention provides a load carrying body with a flexible floor which is winched out of the rear end portion of the body.

Preferred features of the load carrying body are set forth in the claims.

The invention will be described further, by way of example only, with reference to the accompanying drawings.

of the sidewalls 16. The tailgate 18 is self-locking and, when unlocked, can be opened by means of hydraulic rams 22 or alternatively by the material 19 as it is ejected.

The floor of the load space between the headboard 17 and the rear end of the body 13 is constituted by a flexible belt 23 which rests on the substantially flat approximately horizontal upper surface of the base 14 and occupies the full width of the load space between the sidewalls 16. The belt is made of a hard wearing non-stretchable material, such as that used for conveyor belts in mining installations, for example. The front end of the belt 23 is releasably connected to the underside of the headboard 17 as shown in Figures 9 and 10. A transverse series of projections 24 provided in the form of circular annular steel discs cross-welded to a bottom wall of the headboard 17. The projections 24 fit in corresponding holes 26, e.g. 50 mm in diameter, in the end portion of the belt 23, the belt being retained by bolts 27. The other end of the belt 23 passes over the rear end of the base 14 and is connected to a winch 28 lying below the level of the upper surface of the base 14.

The winch comprises a drum 29 having a hollow cylindrical peripheral wall 31 which extends over the full width of the load space and on which the belt 23 is wound. The outer surface of the cylindrical wall 31 is provided with a series of projections 24 (as described above) which fit in a series of holes 26 (as described above) provided in the adjacent end of the belt 23 (Figure 8).

One end of the drum 29 is constituted by a sheave 32 on which is wound a cable 33 in the form of a steel wire rope, for example. The cable 33 is guided along a path as shown in the drawings by a guide system comprising rotatable guide elements or pulleys 34 to 39 and is connected to a lug 41 on the headboard 17 at a position substantially on the centre-line of the body 13.

The winch 28 has a reversible hydraulic motor 42 mounted in an annular frame 43 freely fitted in the end of the drum 29 opposite to the end closed by the sheave 32, which is mounted on an axle 44 by bearings 46 within the drum 29 and thereby kept out

of contact with the loose material. The hydraulic motor 42 drives reduction gearing 47 bolted to the inside of the cylindrical wall 31 of the drum 29. The drum rotates about a horizontal axis 48 which extends transversely to the centre-line of the body 13 and which is defined by the bearings 46 and bearings (not shown) within the reduction gearing 47. The frame 43 and the axle 44 are fixed to perspective pivot arms 49 mounted on respective pivots 51 which are in turn mounted on flanges 52 fixed to the base 14.

To unload the fully laden trailer 12, the tailgate 18 is raised by means of the hydraulic rams 22 and the hydraulic motor 42 is operated to drive the drum 29 of the winch 28 in the clockwise direction as viewed in Figure 1. The belt 23 is wound on to the winch, thereby drawing the floor of the load space towards the rear end of the base 14. The belt 23 thus carries the loose material 19 out of the rear end of the body 13 and deposits it as a gradually rising heap behind the trailer 12, as shown in Figures 2 and 3. The headboard 17, which is drawn along with the belt 23, merely serves to prevent forward spillage. Compressed air (or another fluid under pressure) can be injected under the floor in order to reduce friction between the belt 23 and the upper surface of the base 14, which may be of steel or aluminium, for example. The supply of compressed air may be discontinued after the floor has started to move or may be continued until the load has been completely discharged. Compressed air injection orifices 53 are provided in an array extending along and across the base and can be connected to piping (not shown) communicating with a compressor (not shown) driven by the engine of the vehicle. Loose material adhering to the surface of the belt 23 is removed by a spring-loaded scraper 54 which bears against the outer surface of the belt as it is wound on and off the winch.

As the winch 28 rotates in the clockwise direction and takes up the belt 23 on the drum 29, the sheave 32 pays out the cable 33 so that the headboard 17 is free to be drawn along the body 13 by the belt 23. When the motor 42 is reversed, the winch drum 29 pays out the belt 23 while the cable 33 is wound on to the sheave 32, thereby causing the cable to draw the headboard 17 (and with it the belt 23) towards the front end of the

base 14. It will be appreciated that the belt diameter on the drum 29 will normally differ from the cable diameter on the sheave 32. In particular, as the belt is wound on the drum, the belt diameter will gradually increase. On the other hand, since the turns of cable on the sheave 32 will normally lie next to one another, the cable diameter on the sheave will remain approximately constant. In order to compensate for the varying difference between the belt diameter and the cable diameter on the winch, the guide system for the cable 33 includes a compensating mechanism which varies the path of the cable during rotation of the winch 28. The compensating mechanism comprises a hydraulic cylinder 56 which drives a piston 57 carrying the pulley 36, around which the cable 33 turns through 180°. The hydraulic cylinder 56 is hydraulically linked to the hydraulic circuit of the motor 42, as shown in Figure 11, so that the hydraulic pressure in the cylinder 56 is controlled to maintain the tension in the cable 33 approximately constant.

Referring to Figure 11 in more detail, a hydraulic pump 58 is driven by a power take off from the engine of the vehicle, and the supply of hydraulic fluid from the pump 58 to the hydraulic motor 42 is controlled by a directional control valve 59, which is shown in the "off" position and which has two "on" positions for driving the motor 42 (and hence the winch 28) in opposite directions. The supply of hydraulic fluid pressure to the cylinder 56 is controlled by two valves 61,62. The control valve 61 is effective to control the cable tension as the cable 33 is unwound from the winch during the ejection of the loose material, and the control valve 62 is effective to control the cable tension during the winding of the cable 33 on to the winch 28 during retraction of the headboard 17 towards the front end of the load carrying body 13. The control valves 61,62 act in such a way as to keep the pressure acting on the piston 57 substantially constant. Thus, slackness in the cable 33 and in the belt 23 is avoided during the unloading of the loose material and the paying off of the belt from the winch.

During use, the wear on the belt 23 is uneven, gradually increasing from the end connected to the winch drum 29 towards the end connected to the headboard 17. The above-described connection of the belt ends to the drum and the headboard by means of the projections 24 and holes 26 provides the advantage that the worn belt can be turned round end to end in order to increase its useful life.

The ejection and retraction times are equal and typically can be set at 500 mm/s, which equates to 16 seconds for a load space 8 m long. The loose material can be ejected with the vehicle stationary or moving forwards or in reverse. It is easy to control ejection of only a portion of the loose material. The use of the body 13 is not restricted to the carrying of loose material, since the movable floor can assist in the loading and unloading of rigid loads such as palletised loads, for example, in conjunction with a fork lift truck or telescopic material handler.

CLAIMS:**1. A load carrying body for a vehicle, comprising:**

- (a) a load-bearing base having front and rear ends;**
- (b) a transverse member which is movable along the upper surface of the base between a front position and a rear position;**
- (c) a reversible winch mounted to the base, the winch lying below the level of the upper surface of the base;**
- (d) a floor constituted by a flexible belt which rests on the upper surface of the base, a first end of the belt being connected to the transverse member and a second, opposite end of the belt being connected to the winch so that rotation of the winch in a first direction winds the belt on to the winch, thereby drawing the floor and with it the transverse member towards the rear end of the base, and rotation of the winch in a second, opposite direction pays out the wound belt from the winch;**
- (e) a cable having one end connected to the transverse member and the other end connected to the winch so that rotation of the winch in the said second direction winds the cable on to the winch; and**
- (f) a guide system which guides the cable along a path such that rotation of the winch in the said second direction causes the cable to draw the transverse member and with it the floor towards the front end of the base, the guide system including a compensating mechanism which varies the path of the cable during rotation of the winch, so as to compensate for a difference between the belt diameter on the winch and the cable diameter on the winch, the difference varying as the belt is wound and unwound.**

2. A load carrying body as claimed in claim 1, in which the winch is mounted so as to be pivotable relative to the base about a transverse pivot axis parallel to the winch axis.
3. A load carrying body as claimed in claim 1 or 2, in which the winch comprises a drum around which the belt is wound, one end of the drum constituting a sheave around which the cable is wound.
4. A load carrying body as claimed in claim 3, in which the winch includes a hydraulic motor at the other end of the drum.
5. A load carrying body as claimed in claim 4, in which the hydraulic motor drives the drum via reduction gearing within the drum.
6. A load carrying body as claimed in any of claims 3 to 6, in which the drum rotates about bearings within the drum.
7. A load carrying body as claimed in any preceding claim, in which the belt is releasably connected to the transverse member and to the winch so that the belt can be turned round end-to-end.
8. A load carrying body as claimed in claim 7, in which each end of the belt has a transverse series of holes which receive corresponding projections provided on the transverse member and the winch respectively.
9. A load carrying body as claimed in any preceding claim, including a scraper which bears against the outer surface of the belt as it is wound on and off the winch.

10. A load carrying body as claimed in any preceding claim, in which the compensating mechanism comprises a guide element around which the cable turns along the said path and a piston-and-cylinder device for moving the guide element to vary the said path.

11. A load carrying body as claimed in any preceding claim, in which the base has orifices for injecting fluid under pressure between the floor and the base in order to reduce friction.

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9913952.9 **15 June 1999 (15.06.1999)** **GB**

(71) Applicant (for all designated States except US): **MULTIDRIVE LIMITED [GB/GB];** Thirsk Industrial Park, York Road, Thirsk, Yorkshire YO7 3BX (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BROWN, David, John, Bowes** [—/GB]; Ravenssthorpe Manor, Boltby, Thirsk, Yorkshire YO7 2DX (GB).

(74) Agent: **GODWIN, Edgar, James; Marks & Clerk, 57-60** Lincoln's Inn Fields, London WC2A 3LS (GB).

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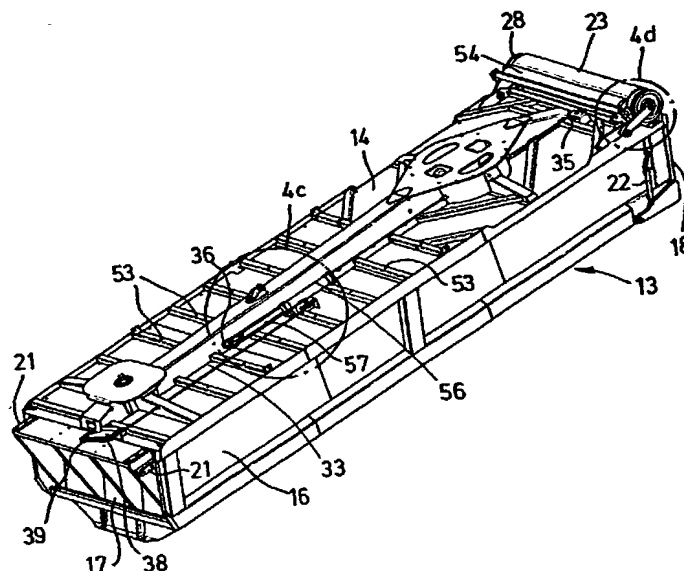
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Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **LOAD CARRYING BODY**



(57) Abstract: A floor constituted by a flexible belt (23), resting on the upper surface of a loadbearing base, has one end connected to a headboard (17) and the other end connected to a winch (28). A cable (33) has one end connected to the headboard and the other end connected to the winch. A guide system for the cable including a compensating mechanism (36, 56, 57) which varies the path of the cable during rotation of the winch, so as to compensate for a difference between the belt diameter and the cable diameter on the winch, the difference varying as the belt is wound and unwound.

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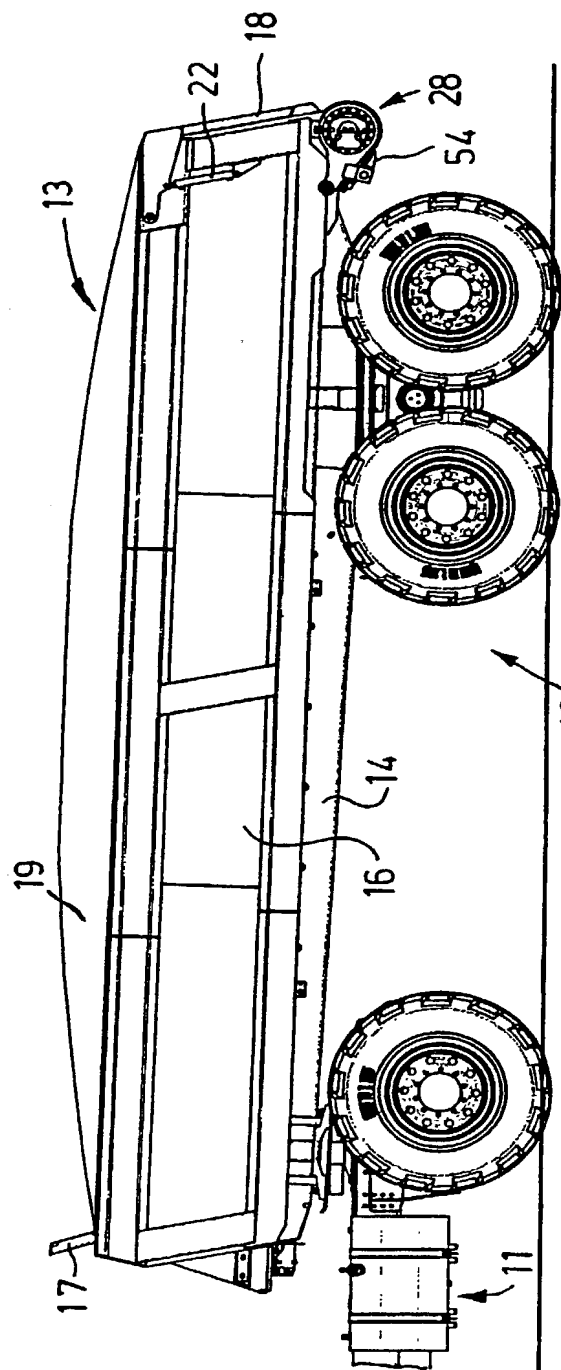


Fig. 1

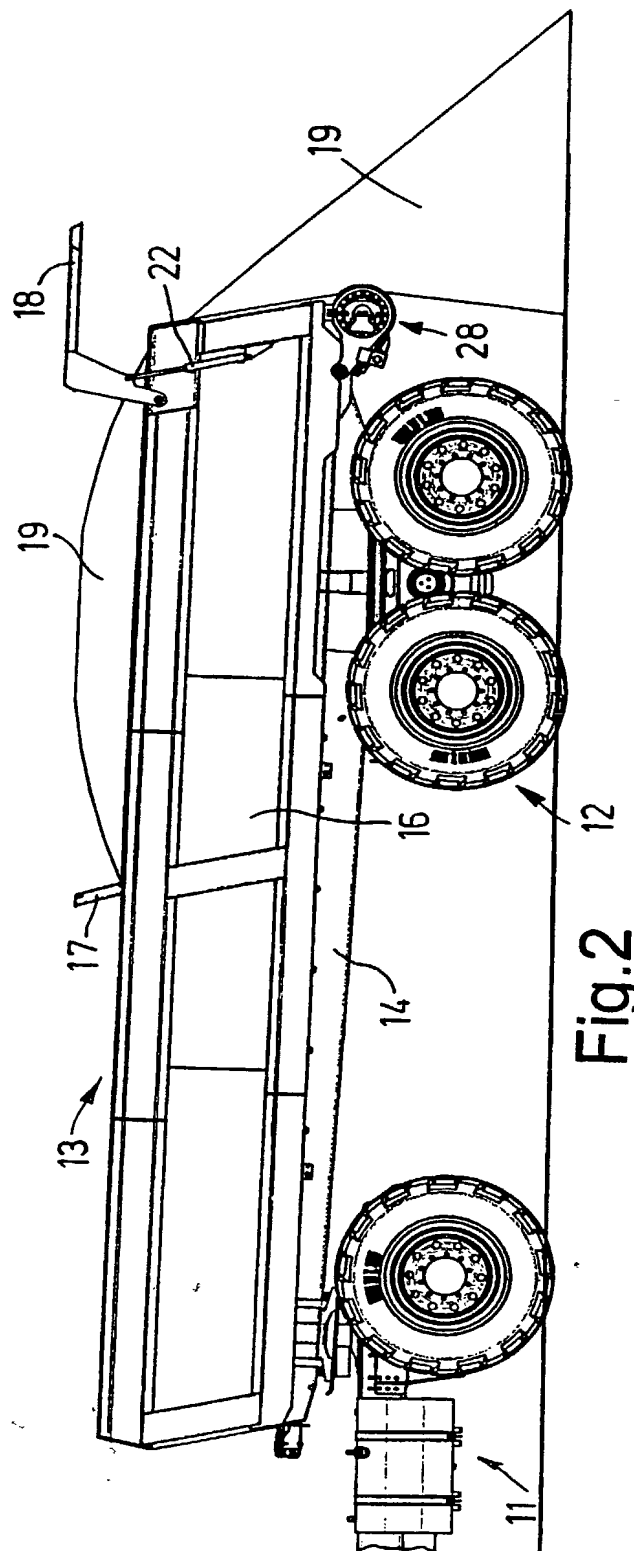
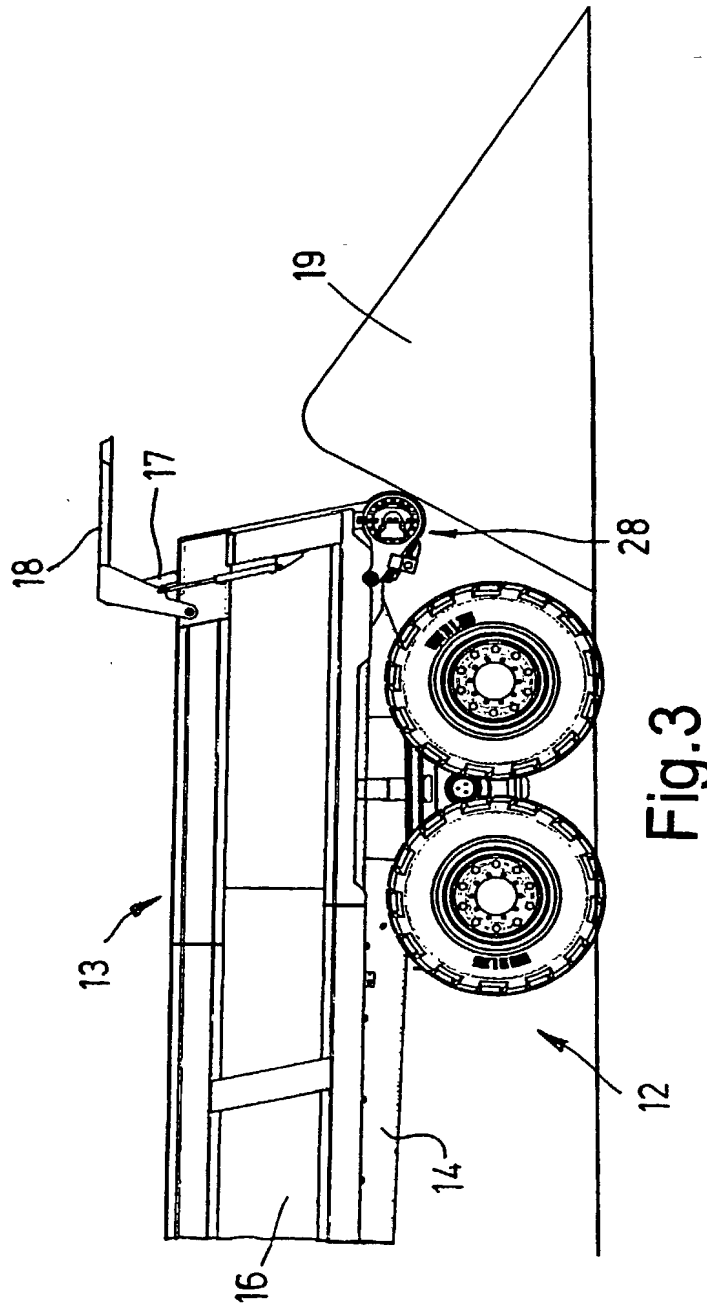


Fig. 2

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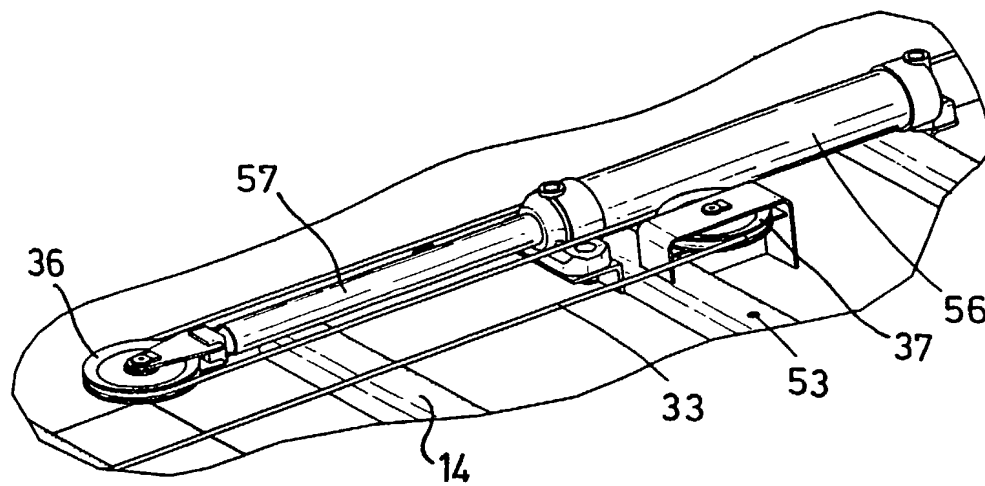


Fig.4c

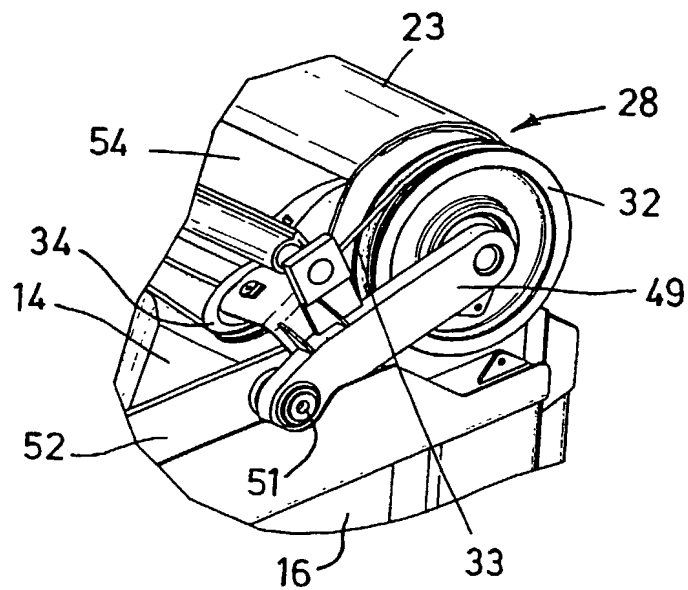


Fig.4d

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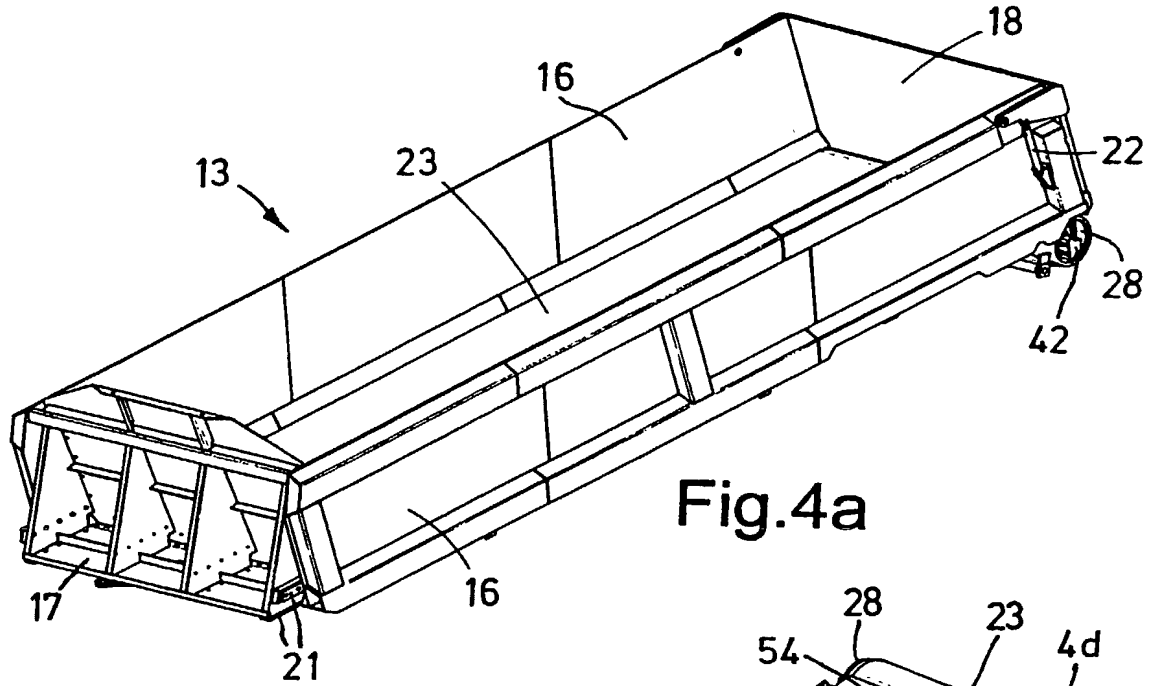


Fig.4a

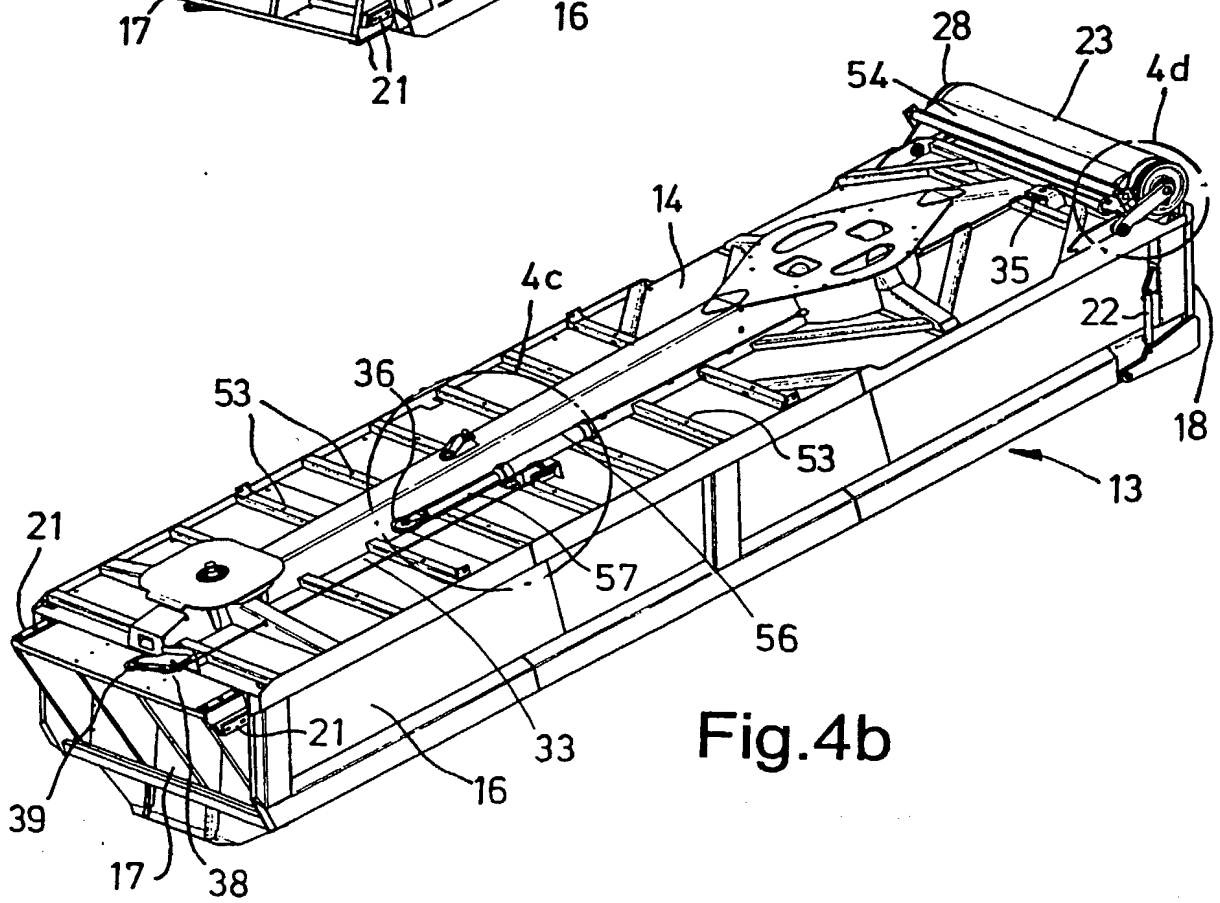
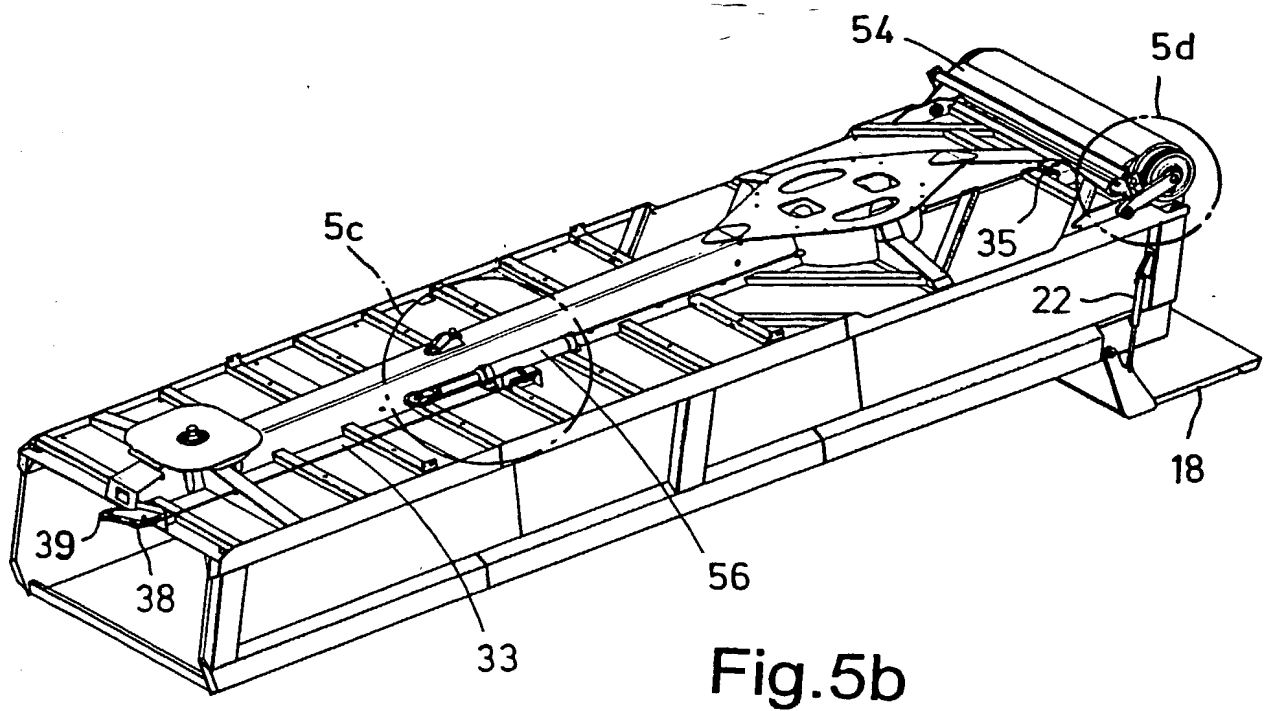
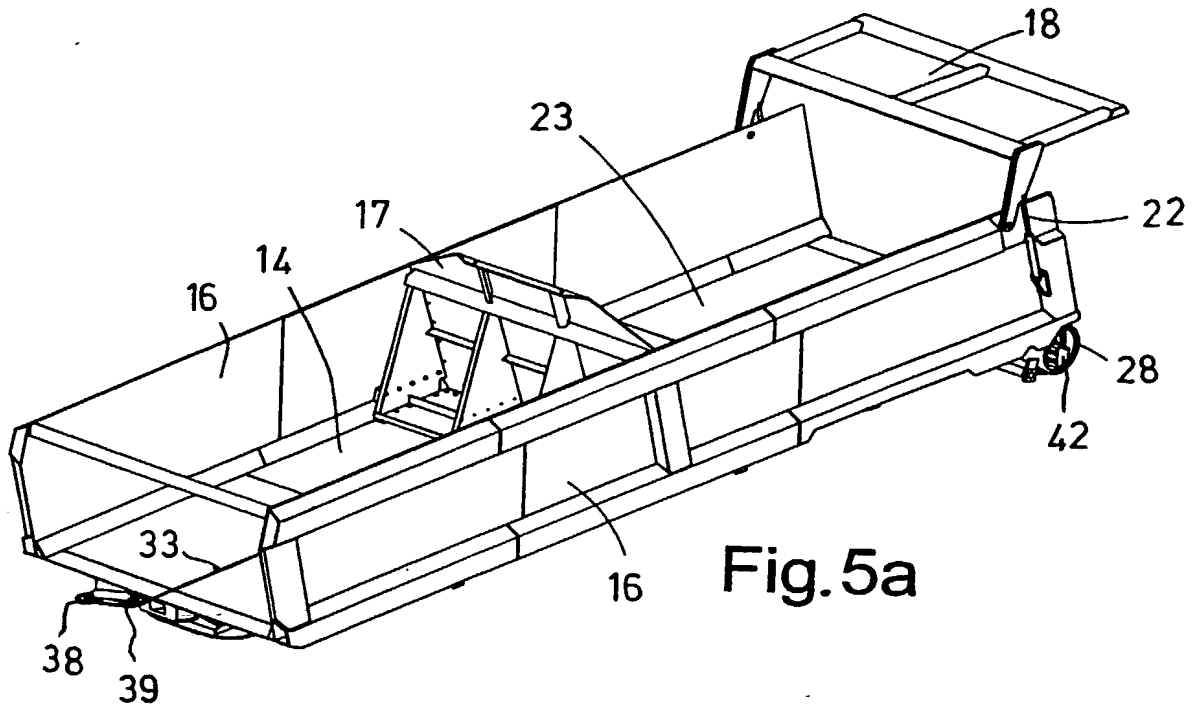


Fig.4b

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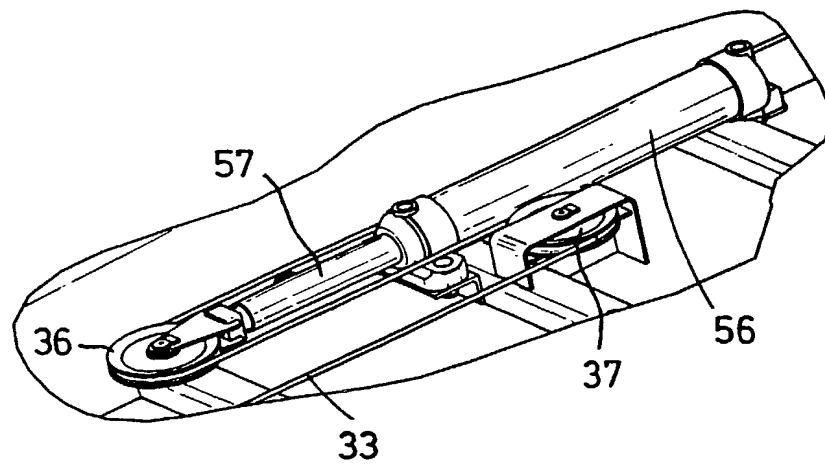


Fig.5c

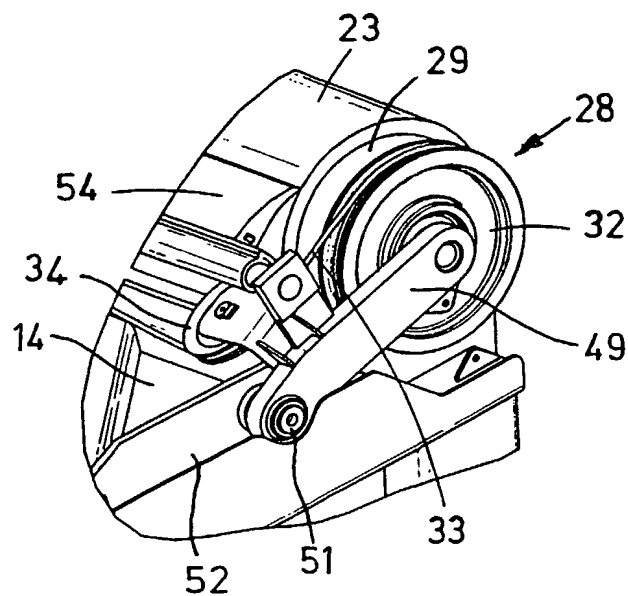
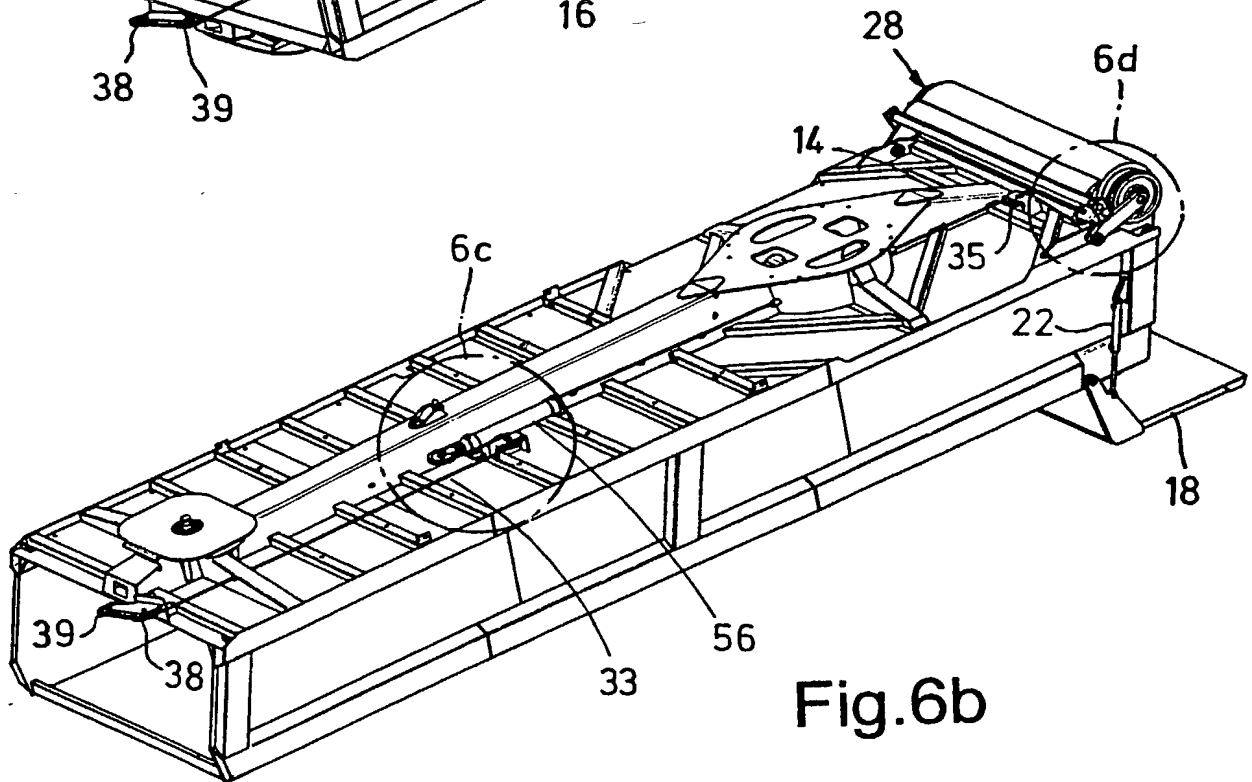
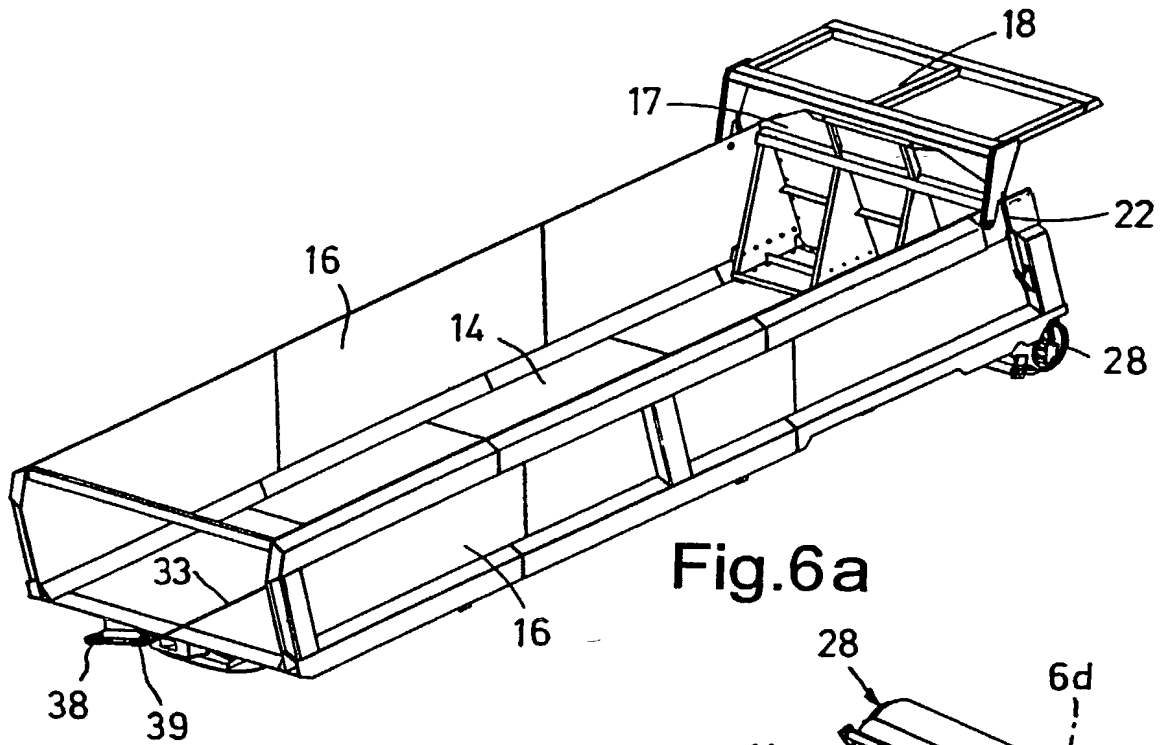
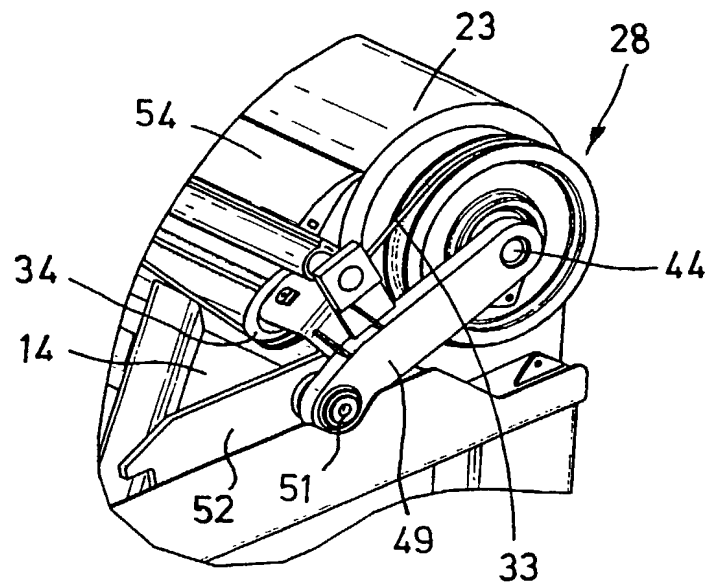
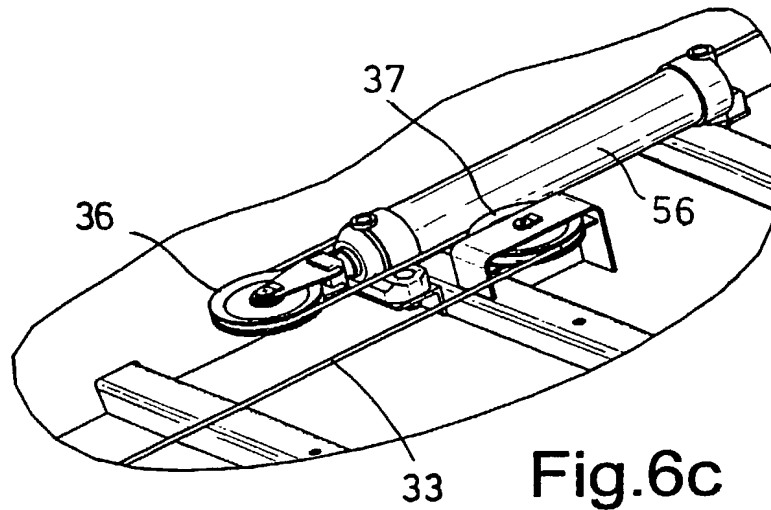


Fig.5d

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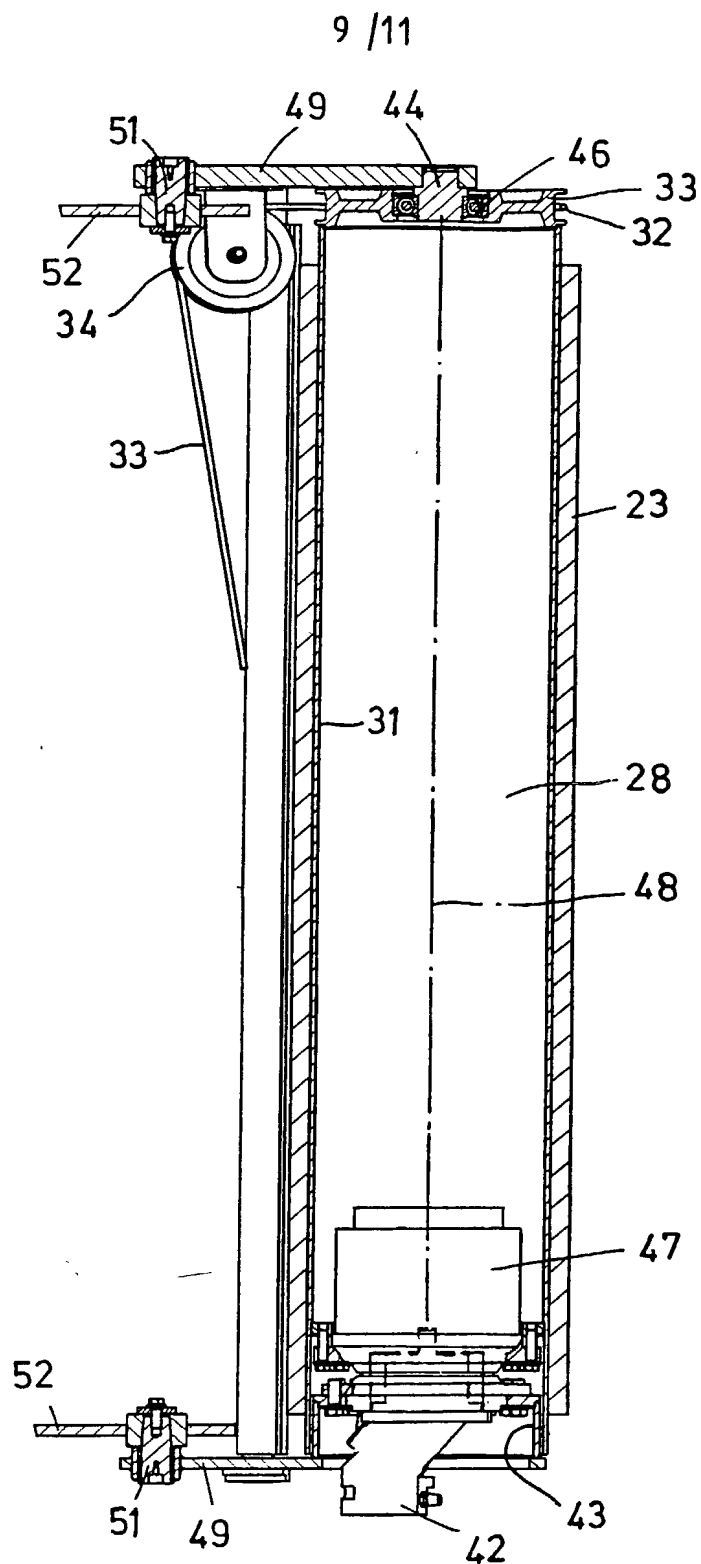


Fig.7

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Fig.8

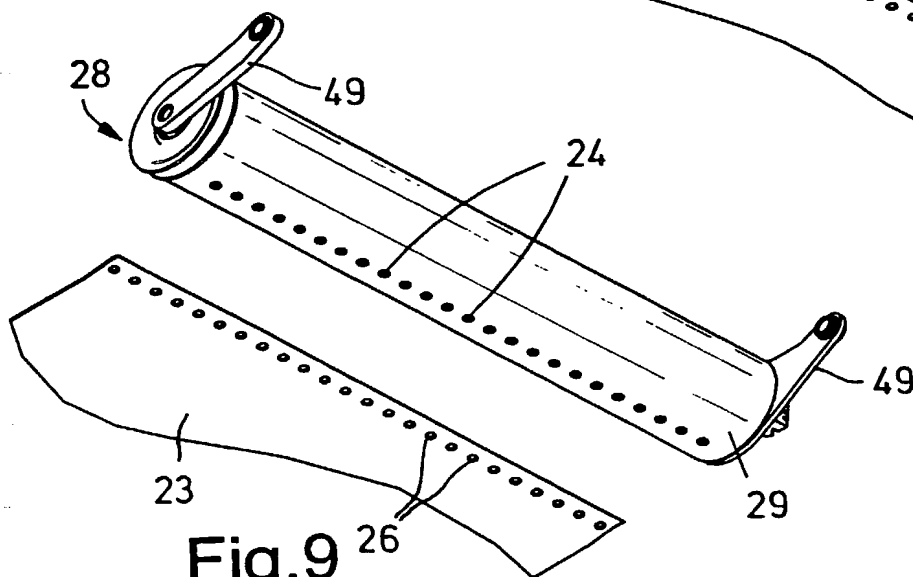
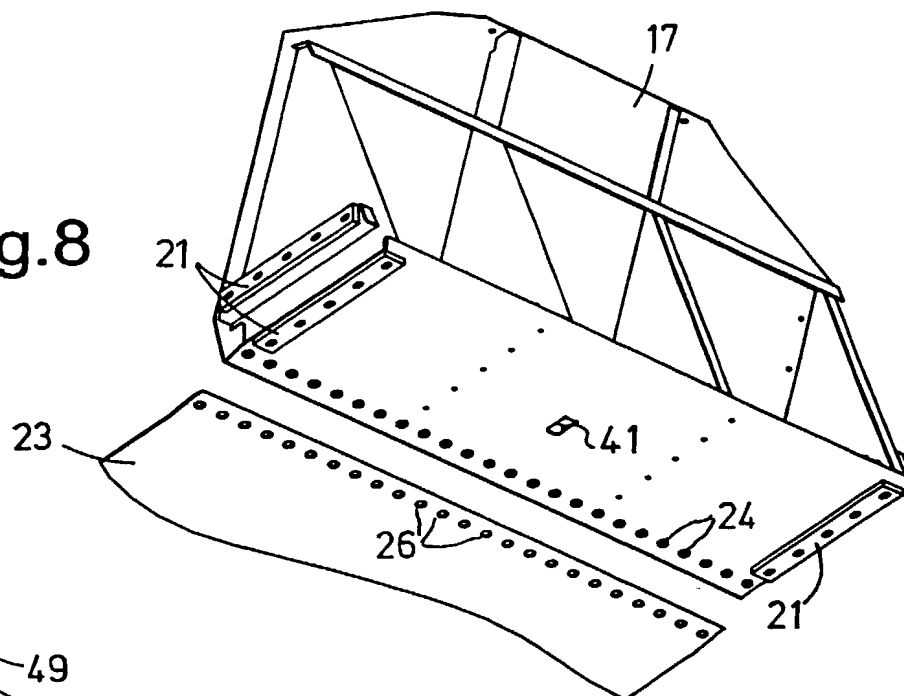
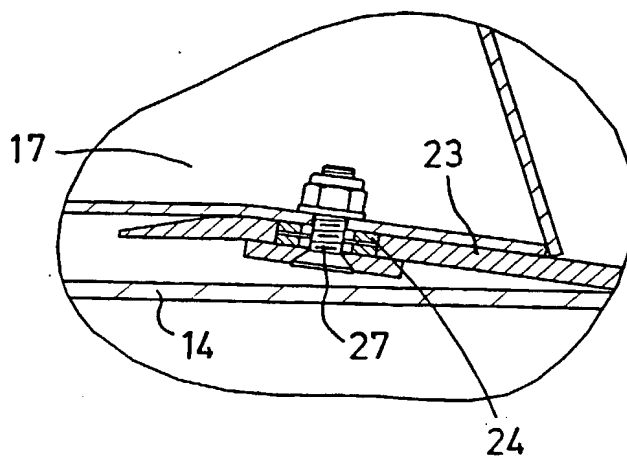


Fig.9

Fig.10



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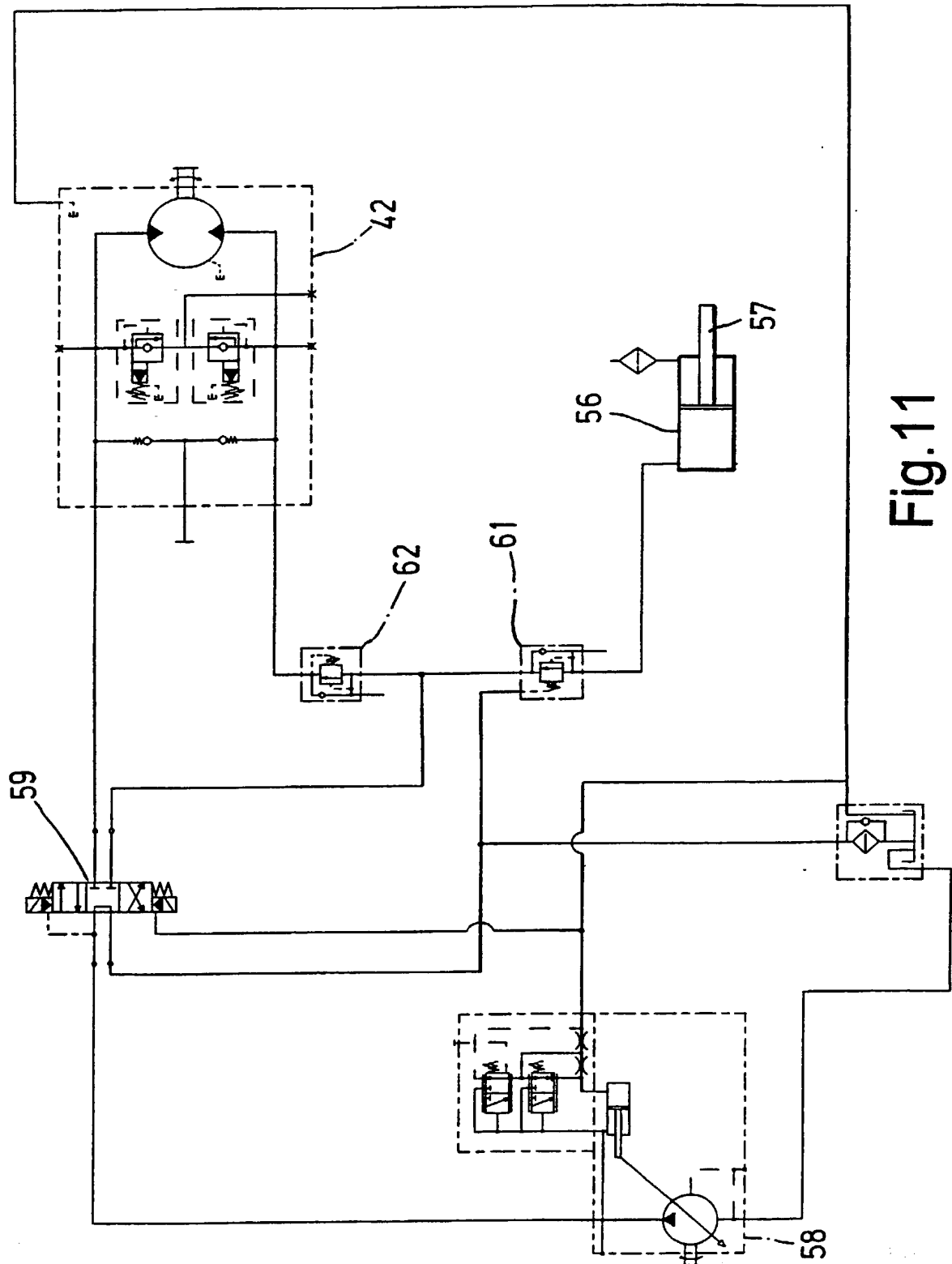


Fig.11

USA

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Load Carrying Body

which is described and claimed in:

[] the attached specification
[x] the specification in application Serial No. 10/018,414 filed 12/14/01
[x] PCT International Application No. PCT/GB00/02277 filed 06/13/00
(if applicable) and amended on _____ under Article 19 PCT
and on _____ under Article 34 PCT

I hereby state that I have reviewed and understand the contents of the above-identified application specification, including the claims, as amended by any amendment specifically referred to herein.

I acknowledge the duty to disclose all information known to me that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Number	Country	Date Filed	Priority Claimed
9913952.9	United Kingdom	15 June 1999	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
			<input type="checkbox"/> yes <input type="checkbox"/> no
			<input type="checkbox"/> yes <input type="checkbox"/> no
			<input type="checkbox"/> yes <input type="checkbox"/> no

I hereby claim the benefit under Title 35, United States Code §1.20, of the United States Application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56, and which became available to me between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)
_____	_____	_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint

Levisohn, Lerner, Berger & Langsam

jointly, and each of them severally, my attorneys and attorney, with full power of substitution, delegation and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent and to transact all business in the Patent and Trademark Office connected therewith. Please direct all correspondence and telephone calls to:

Levisohn, Lerner, Berger & Langsam
757 Third Avenue
Suite 2400
New York
New York 10017
United States Of America

Full Name of first Inventor:

Brown, David John Bowes

Residence:

United Kingdom GBX

Citizenship:

British

Post Office Address:

Ravensthorpe Manor, Boltby

Thirsk, Yorkshire YO7 2DX, United Kingdom

Signature of first inventor:



Date:

14/01/02